

(No Model.)

H. S. HALLWOOD.
BRICK KILN.

2 Sheets—Sheet 2.

No. 436,524.

Patented Sept. 16, 1890.

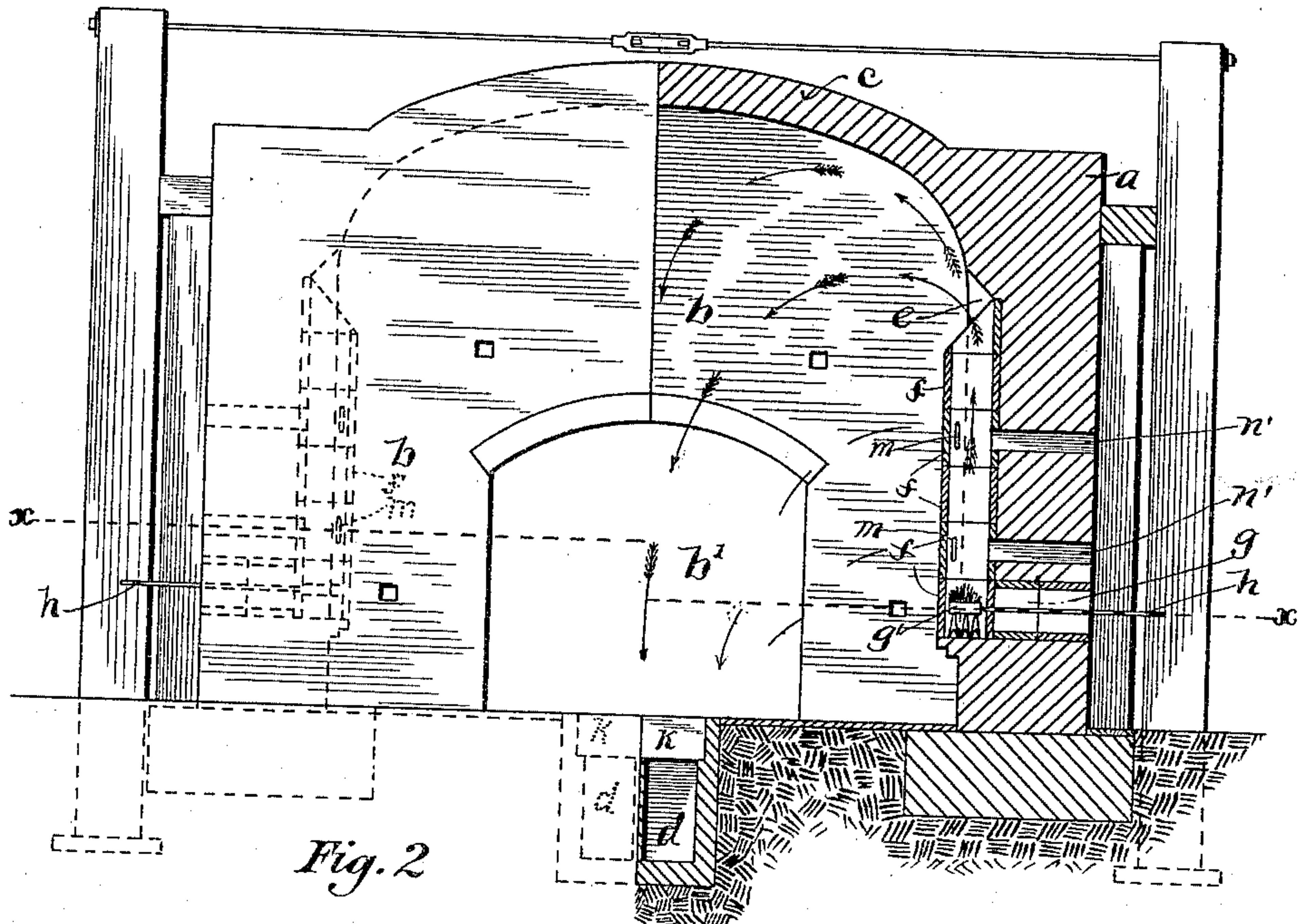


Fig. 2

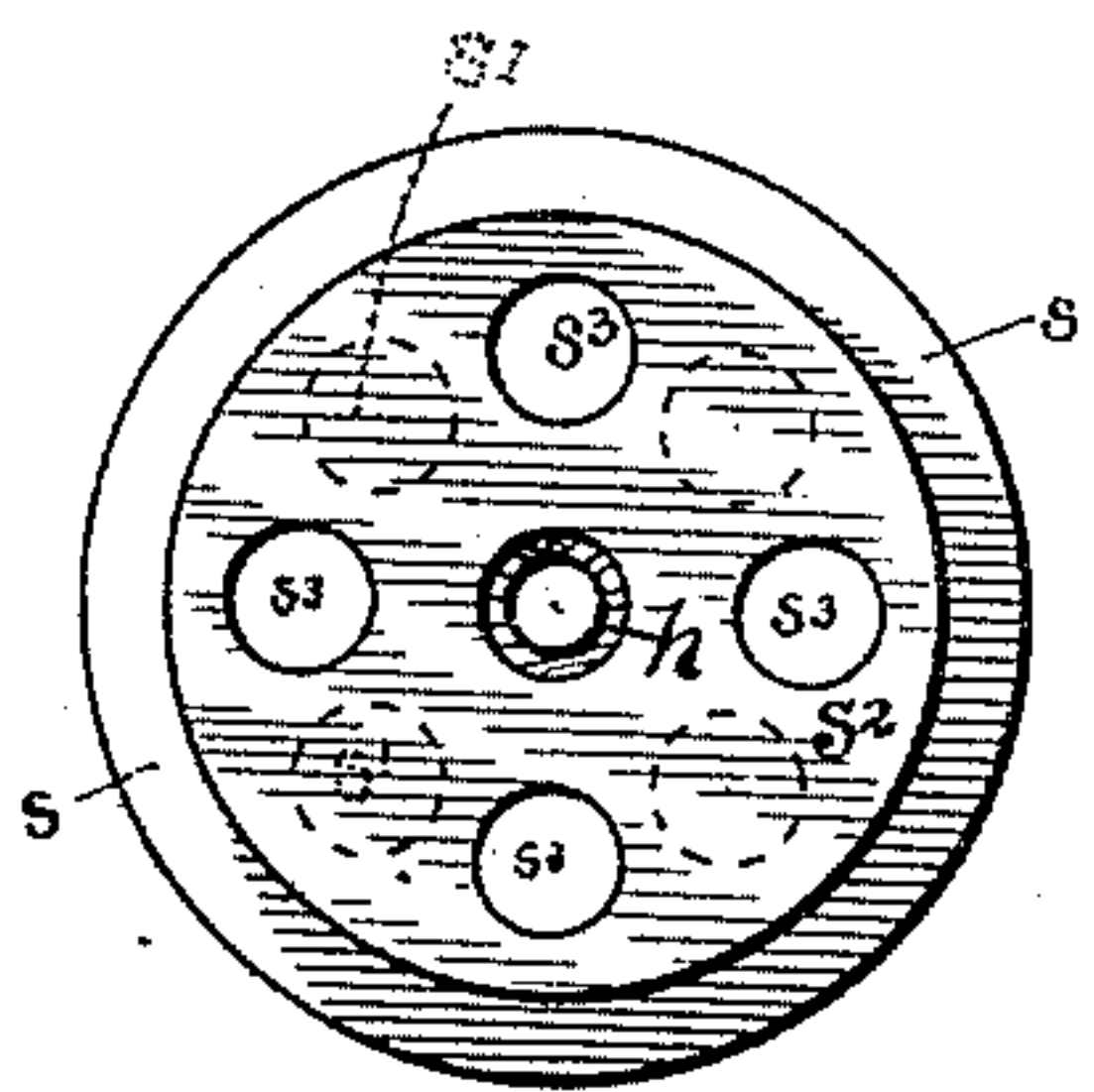


Fig. 3

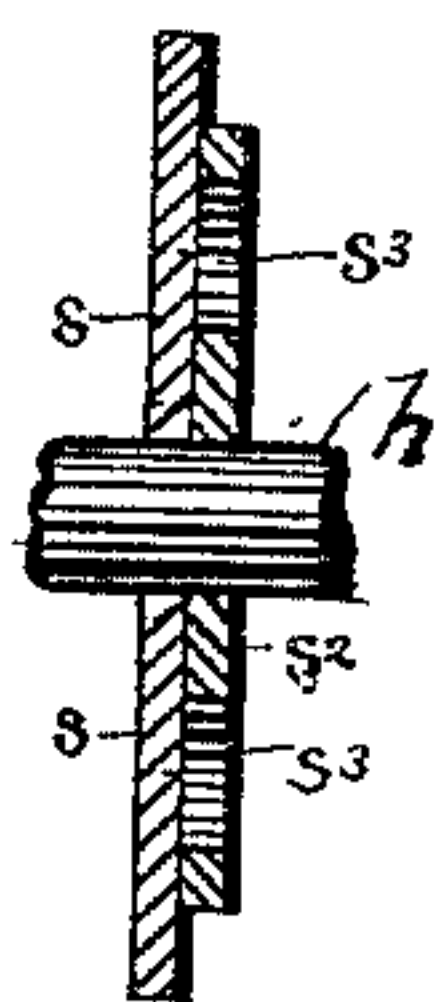


Fig. 4

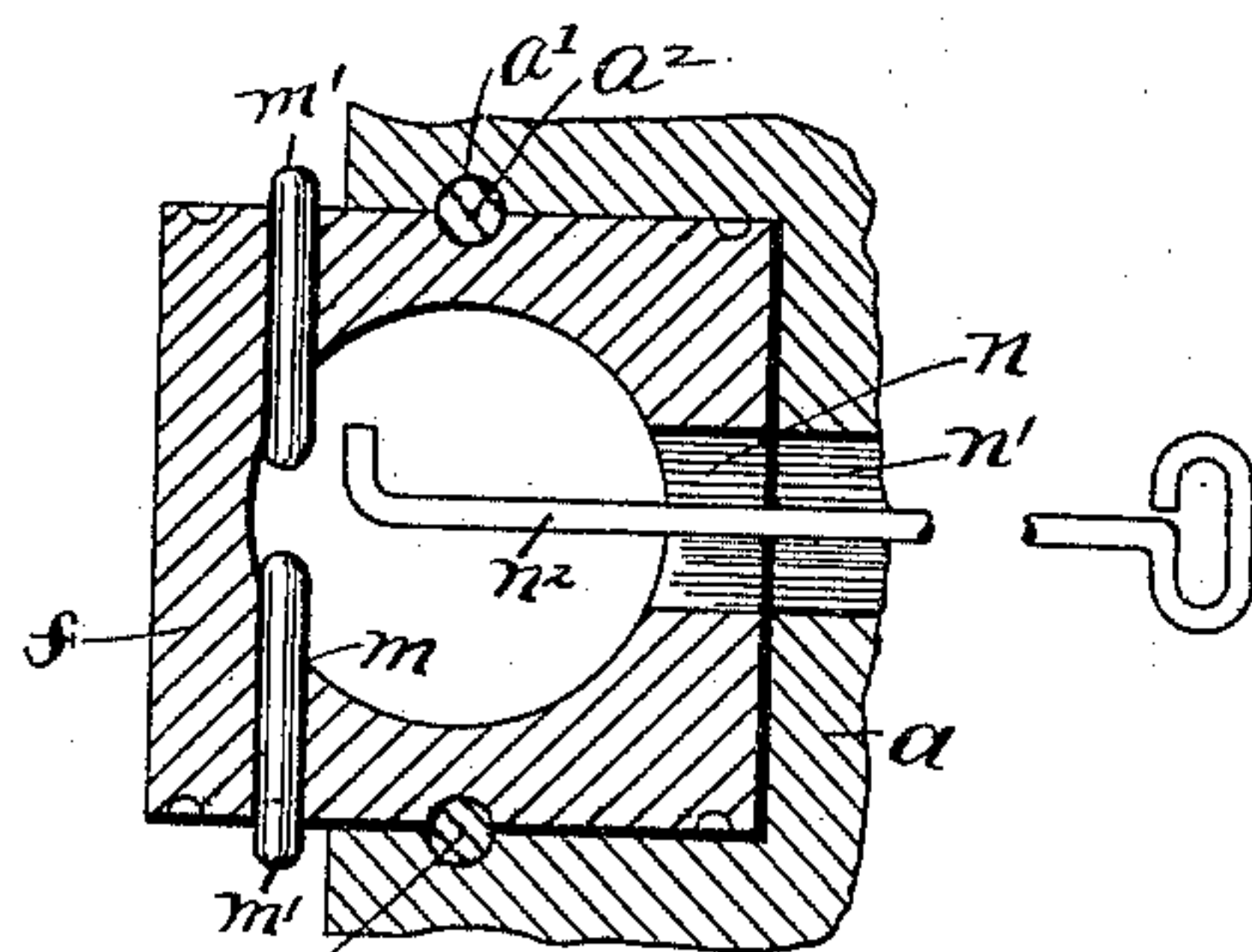


Fig. 5

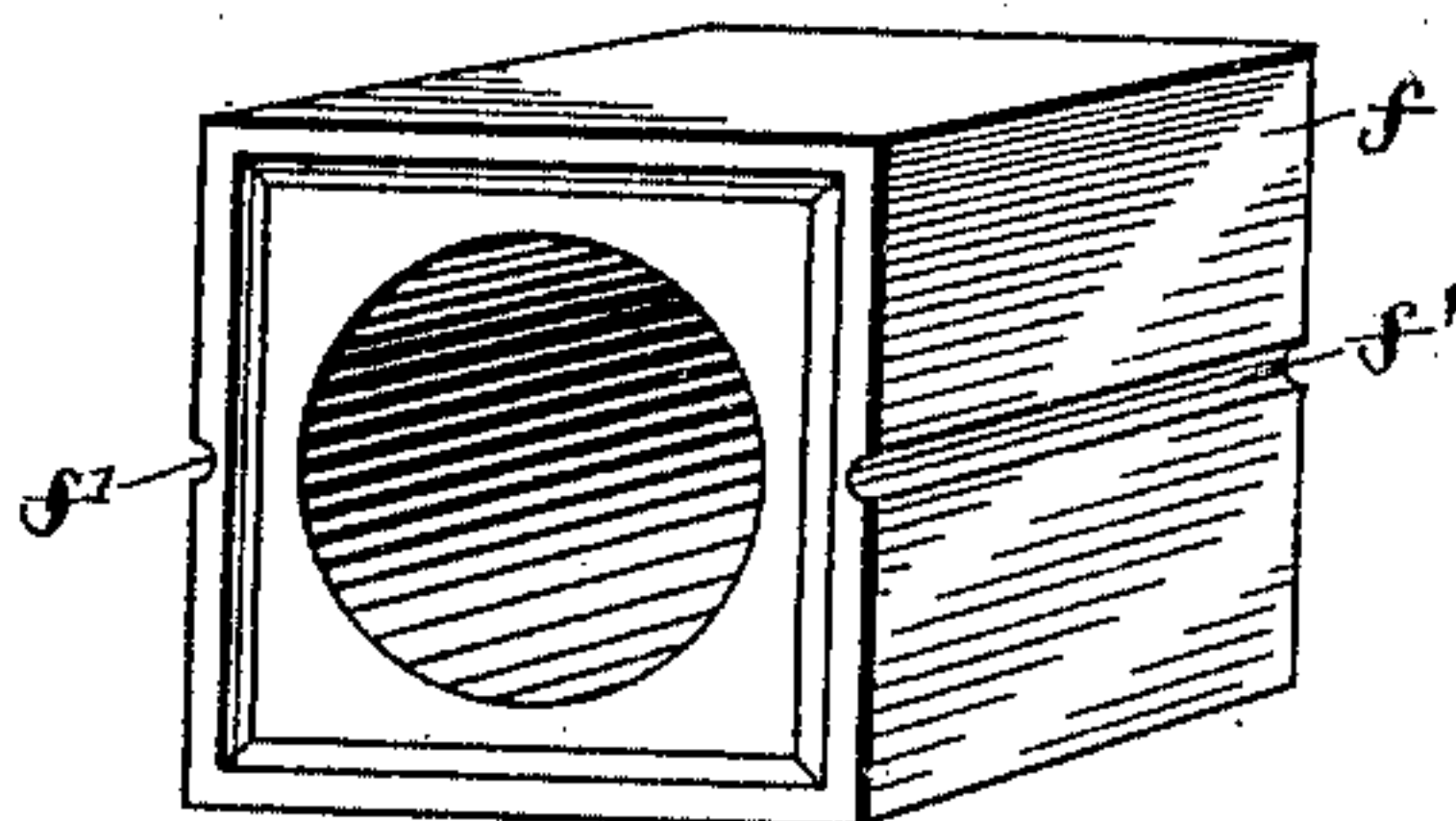


Fig. 6

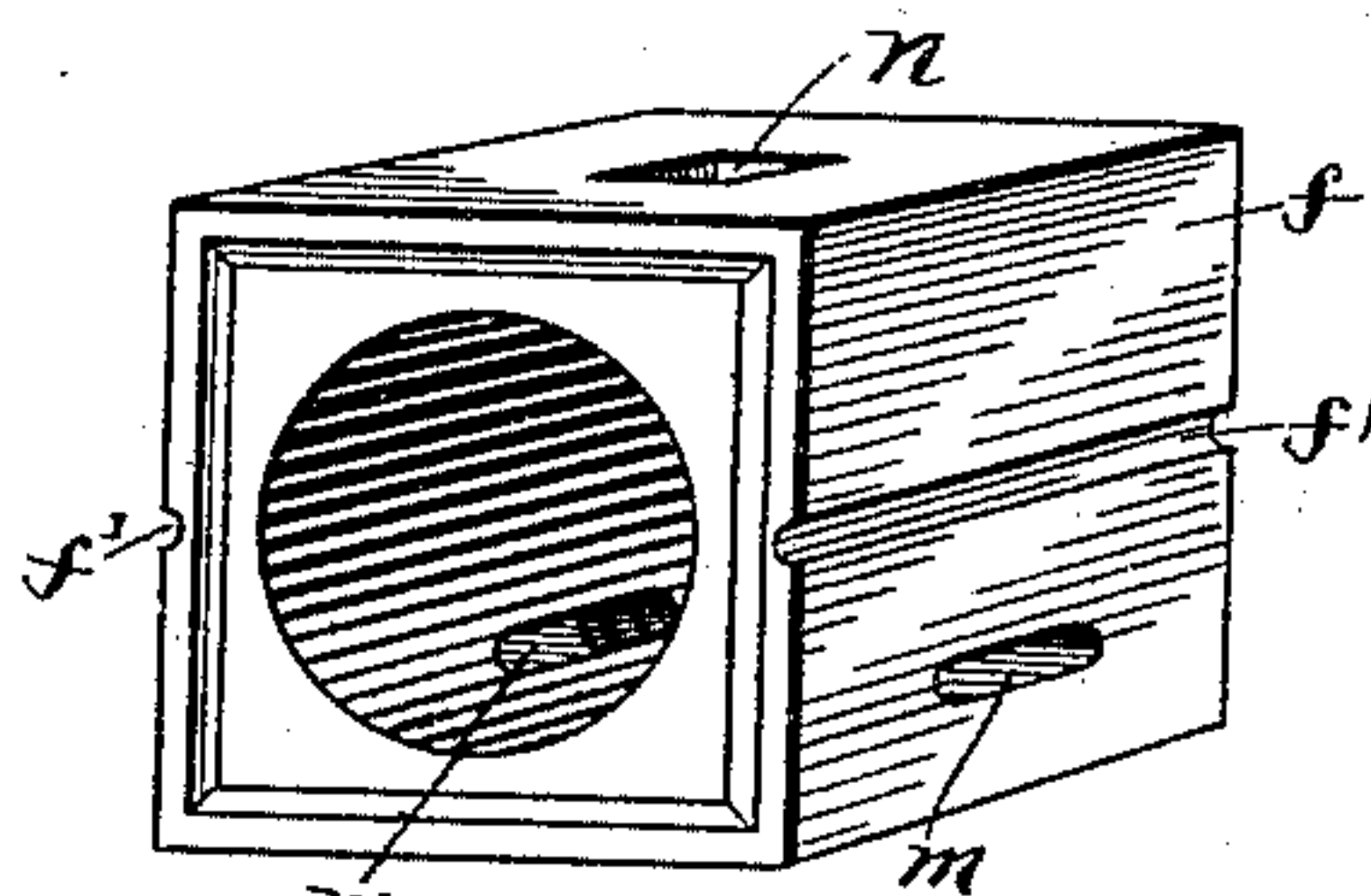


Fig. 7

WITNESSES:
Colman & Perry
E. E. Pragg.

INVENTOR
HENRY S. HALLWOOD.
BY
Staley & Shepherd
ATTORNEYS

UNITED STATES PATENT OFFICE.

HENRY S. HALLWOOD, OF COLUMBUS, OHIO.

BRICK-KILN.

SPECIFICATION forming part of Letters Patent No. 436,524, dated September 16, 1890.

Application filed April 24, 1890. Serial No. 349,227. (No model.)

To all whom it may concern:

Be it known that I, HENRY S. HALLWOOD, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a certain new and useful Improvement in Brick-Kilns, of which the following is a specification.

My invention relates to the improvement of brick-kilns, and has particular relation to that class of kilns which are particularly adapted for burning fire-brick or paving-blocks.

The objects of my invention are to so construct a brick-kiln as to distribute heat from the flues along the inner side walls of the kiln; to thus distribute the heat equally; to so construct and arrange sectional wall-flues as to admit of the entire flue or any section thereof being replaced when desired and to accomplish this object without injury to the kiln-wall; to so construct the kiln-flues as to admit of the flues being made to communicate at one or more points with the interior of the kiln during the process of burning; to produce a kiln of superior construction for imparting to the brick uniform heat by burning natural or artificial gas, and at the same time to so construct the same as to provide for the addition thereto of outside furnaces, if desired; to construct said kiln in a simple and durable manner and in such form as to produce perfect combustion within the flues and a strong downdraft therefrom. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a horizontal section of the kiln, taken on two planes, as indicated on line xx of Fig. 2. Fig. 2 is a partial end view and partial transverse section taken through one of the wall-flues. Fig. 3 is a detail view in elevation of one of the flue-dampers. Fig. 4 is a central vertical section of said damper. Fig. 5 is a transverse section of one form of tile used in the construction of the wall-flues. Fig. 6 is a perspective view of a different form of tile used in said construction, and Fig. 7 is a perspective view of the form shown in Fig. 5.

Similar letters refer to similar parts throughout the several views.

a represents the side walls, b the end walls, and c the arched top of my improved kiln.

Formed beneath the center of the width of

the kiln within the ground are two longitudinal and parallel smoke-flues d , said flues beginning at a point adjacent to the rear end wall and passing outward beneath the front end doorway b' to a suitable smoke-stack or other desired point. Formed in the inner sides of the side walls a at intervals are vertical flue seats or depressions e , said depressions extending from points near the tops of the side walls to the lower portions thereof and a short distance from the floor of the kiln. Within each of the flue-seats e , I build a vertical flue composed of hollow tiles f , seated one upon the other, and having their central hollows communicating. As shown in the drawings, these tiles are each provided on their vertical sides with central semicircular and vertical grooves f' . As shown in Fig. 5 of the drawings, these grooves f' , when the tiles are placed in position, are made to face similar grooves a' , formed in the sides of the flue-seats e . The two grooves f' and a' are thus made to form a vertical keyway, which is adapted to receive a vertical plug or key a^2 , formed of fire-clay or other similar substance and which operates to lock the tile into connection with the kiln-wall.

As shown in the drawings, the tiles which form the flue are of such width or thickness as to abut against the kiln-wall and have their inner sides projecting into the burning-chamber beyond the inner surfaces of the side walls. The lower tile of each flue has communicating therewith the inner end of an oblong tile g , which leads transversely through the kiln side wall.

h represents the gas-pipes, one of which enters from the outside of the kiln through each of the inlet-tile g . Each of said pipes terminates within the lower tile of the flue in a suitable burner g' .

As shown in my former patent, No. 424,474, under date of April 1, 1890, the ground-flues d are uncovered, with the exception of the cross-tiles k , arranged at intervals over said flues, the openings between which communicate with the interior of the kiln.

In the construction of each flue I preferably employ two or more tiles having the construction shown in Figs. 5 and 7 of the drawings—i. e., tiles provided on their inner sides with slotted openings m , which lead laterally

outward through the inwardly-projecting portions of the tiles and form a communication between the interior of the flue and the interior of the kiln. These openings *m* are designed to be temporarily closed, as shown in Fig. 5 of the drawings, by plugs *m'* of fire-clay or other suitable material. The rear side of each of the tiles, which are provided with the openings *m*, is also provided with an opening *n*, which forms a continuation of a transverse kiln-wall opening *n'*, which leads to the outer side of the kiln.

Over the mouth or inlet of each of the tiles *g* is fixed by attachment to the kiln-wall a damper, which consists of a metallic disk *s*, provided with a central hole, through which passes the gas-pipe *h*. This disk is also provided at equidistant points about said central pipe-hole with perforations *s'*, which are adapted to be covered or partially covered, when desired, by means of a pivoted damper-plate *s²*, which loosely surrounds the pipe *h* adjoining the face of the plate *s*, said damper-plate being provided with holes *s³*, corresponding in number and arranged in the same circle with holes *s'*.

The operation of my improved kiln is as follows: The brick to be burned having been piled in a desired manner in the kiln-burning chamber and the end doors of the kiln closed, gas is turned into the pipes *h* and ignited at the burners *g'*. The flame thus produced operates to thoroughly heat each tile of the flue, and said flames being fed by currents of air through the tile *g* a strong upward draft may be attained. The incoming air-current may, however, be regulated by the partial opening or closing of the openings *s'* of the damper-disk *s*. As indicated by the arrows in Fig. 1 of the drawings, the current of hot air which passes out through the top of each wall-flue is drawn by the ground-flue *d* downward through the brick to be burned, and thence into said ground-flue to the stack. Owing to the fact that the wall-flues are made to project, as described, within the burning-chamber and past the inner surfaces of the walls, it will be seen that the heat radiating from the tiles will be directed from the three sides thereof, said tiles thus serving not only to throw heat inward among the brick, but to throw it off laterally and insure a distribution of the heat along the inner side walls of the kiln.

Although the tiles *f*, which are provided with the plug-openings *m*, may be distributed, as desired, along the wall-flues, I preferably employ in each of said flues two of said tiles—one near the upper portion of each of the flues and the other near the lower portion thereof—when it becomes desirable. The brick in the upper and central portion of the kiln having become thoroughly heated, and it being desired to equalize the distribution of the heat throughout the brick to be burned, the brick contained along the sides of the kiln may be subjected to a greater heat by unclosing the

slotted tile-openings *m*. This is accomplished by inserting through each of the wall-openings *n'* and the tile-openings *n* a poker or rod *n²*, having an upturned inner end, said poker being so manipulated that when its inner upturned end is within the tile the plugs *m'* may be forced from their sockets by contact therewith. In this manner it will be seen that the brick which have not received the direct draft of the hot-air currents which pass out through the flue-tops will be subjected to the desired increase of heat, which will result in the equal burning of all the brick contained in the kiln without reference to their locality.

From the fact that the flues herein shown and described are formed in sections, it will be seen that in case one of the tile of a flue should be burned out or become unfit for use the tile may be broken out and a new one substituted therefor.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a brick-kiln, the combination, with the side walls provided with internal flue-depressions, of vertical sectional wall-flues supported within said depressions and projecting, as described, within the burning-chamber, and inlet-flues communicating with said wall-flues through the kiln-wall, substantially as described.

2. In a brick-kiln, the combination, with the side walls, the latter provided with flue seats or depressions, of vertical flues formed of tile-sections, and said flues projecting within the burning-chamber, one or more of the flue-tiles having plugged openings leading to the burning-chamber, a transverse wall-opening communicating with the interior of said plugged tiles and adapted to receive a poker or rod, and wall-inlets communicating with the lower portions of the flues, substantially as specified.

3. In a brick-kiln, the combination of the walls provided with flue seats or depressions, the latter having, as described, half-keyways *a'*, vertical flues within said depressions, said flues formed of hollow tile-sections *f*, each provided with half-keyways *f'*, adapted to meet the keyways *a'*, and earthen keys *a²*, adapted, as described, to connect the flue-sections and flue-walls, substantially as specified.

4. In a brick-kiln, the combination, with the kiln-walls provided with transverse inlet-tiles *g* and internal vertical flue-seats *e*, of wall-flues supported within said flue-seats and projecting within the burning-chamber, said wall-flues formed of tile-sections and communicating with inlet-tiles *g*, gas-pipes *h*, entering the lower portions of the flues through tiles *g*, and suitable dampers fitting over the mouth of said tiles *g*, substantially as described.

HENRY S. HALLWOOD.

In presence of—

C. C. SHEPHERD,
E. E. BRAGG.